

DOCUMENT RESUME

ED 062 710

EA 004 287

AUTHOR Duncan, Robert B.
TITLE Adaptation to a Changing Environment by Modifications
in Organizational Decision Unit Structure.
SPONS AGENCY National Science Foundation, Washington, D.C.
PUB DATE 7 Sep 71
NOTE 33p.; Paper prepared for American Psychological
Association Annual Convention (79th, Washington,
D.C., September 7, 1971)

EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS *Bureaucracy; Decision Making; Environment;
*Management; Management Systems; Models;
*Organization; *Organizational Change;
*Organizational Climate; Participant Involvement;
Power Structure; Speeches

ABSTRACT

This paper presents a model of how organizations adapt to the uncertainty in their environment by making changes in the way they structure themselves for decisionmaking. The research reported here indicates that it is not just a single change in organizational structure, but rather a shifting between a more rigid and more flexible decision structure that facilitates effective adaptation to an uncertain organizational environment. (Author)

ED 062 710

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIG-
INATING IT. POINTS OF VIEW OR OPIN-
IONS STATED DO NOT NECESSARILY
REPRESENT OFFICIAL OFFICE OF EDU-
CATION POSITION OR POLICY.

#78-11

Adaptation to a Changing Environment by
Modifications in Organizational Decision Unit Structure ¹

by

Robert B. Duncan
Graduate School of Management
Northwestern University

Paper prepared for delivery at 79th Annual Convention of American
Psychological Association, September 7, 1971, Washington, D.C.

¹ This research was supported by a National Science Foundation
Grant GS-3054

EA 004 287

Introduction

Some organizational theorists (McNulty 1963) have emphasized that the kind and extent of present day change in organizational environments precludes the prediction of long range planning, and suggest rather that built in flexibility may be more efficient for organizational adaptation than the introduction of purposeful change. In order to adapt to the turbulent nature of environments, the organization needs to learn to make self adjustments. Terreberry's (1968) analysis of organizational environments has emphasized that (1) organizations learn to adapt to the changing contingencies of their environment; (2) changes in organizational environments are such as to increase the ratio of externally induced change to internally induced change. However, none of these theorists have identified the process involved in this adaptation process; they have simply stated that it exists.

The position taken in the research to be presented here is that unless the organization can sense the changes in its external environment by gathering and processing the required information, it cannot remain viable. For example, Schein's (1965: 98-99) discussion of the adaptive-coping cycle indicates that a system must sense a change in its environment, impart the relevant information about the change into those parts of the organization that can act on it and then get some feedback from the

environment on the organization's response. The research presented here focuses on those factors within the organization which facilitate its ability to gather and process information about the uncertainty in its environment. The modifications in the way organizations structure themselves in decision making is the central variable in this discussion of change and adaptation. Decision structure is the "leading part" in Brown's (1971) terms.

Twenty-two decision units² were studied in three Manufacturing and three Research and Development organizations. The objective was to (1) identify the types of structural modifications decision units implemented in adapting to different levels of environmental uncertainty; (2) to identify the relationship between these structural modifications and organizational effectiveness. Decision making is more broadly defined for this analysis than in most decision models to include the gathering and processing of information carried out by groups of individuals that precedes the actual choice process.

Perceived Environmental Uncertainty

Perceived environmental uncertainty was defined for this analysis as being comprised of three components: (1) the lack of information regarding the environmental factors associated with a given decision making situation; (2) not knowing the outcome of a specific decision in terms of how much

² An organizational decision unit is defined as a formally specified work group within the organization under a superior charged with a formally defined set of responsibilities directed toward the attainment of the goals of the organization. Decision making per se may be centered in the formal leader and/or distributed to various members of the specific unit.

the organization would lose if the decision were incorrect; (3) not being able to assign probabilities with regard to how environmental factors are going to affect the success or failure of the decision unit in performing its function³.

Organizational Decision Unit Effectiveness

In this research the concept of organizational effectiveness was applied to decision units within the organizations studied and consisted of three components. First, the effective decision unit must be moving toward attaining its formally defined goals and objectives. Second, to be effective the decision unit must integrate the individual into the social system through clearly defined organizational roles with clearly defined role expectations, such that role conflict and role ambiguity will be low for organizational members. Third, a decision unit must structure its roles such that individual system members can adapt to changes in the organization's environment when they occur.⁴

Decision Unit Structure and Adaptation to Environmental Change

An important function that a decision unit must perform in adapting to the uncertainty in its environment is the gathering and processing of information. The decision unit's structure is thus conceptualized as the critical variable determining the effectiveness or ineffectiveness of the decision unit's information processing potential.

³ For a more detailed discussion of the conceptual and empirical definition of perceived uncertainty, see Duncan (1971c)

⁴ For a more detailed discussion of the conceptual and empirical definition of decision unit effectiveness, see Duncan (1971b)

The cybernetic conceptualization of organization is useful here in understanding the role of structure. This conceptualization as represented by Weiner (1948), Cadwaller (1959), and Deutsch (1963) links the generalized concept of organization to that of information and communication viewing a social system as a set of elements linked almost entirely by way of the intercommunication of information. The essential point is that, while the relations among components of mechanical systems are a function primarily of spatial and temporal considerations and the transmission of energy from one component to another, the interrelations among components in complex organizations come to depend more and more on the transmission of information. All social systems are networks held together by information. For example, in a decision unit the interrelations among the individuals and subgroups comprising it depends on the transmission of information about power and authority relationships, role demands, and whether current performance is meeting the decision unit's output requirements or not. If the information flow is not functioning properly, then there is likely to be ambiguity about power and authority relationships, role demands, and performance demands which may impede the interrelations among the components of the decision unit such that its effectiveness may be less than optimal.

The system must also exhibit some flexibility as well as stability in its functioning so that it can modify current practices to adapt to new situations as they arise in the environment. This requirement that a system be both flexible and stable can be mutually exclusive unless there is some form of compromise in these two strategies. Often, the very

process of developing stability in organizational functioning prevents the system from having the flexibility to adapt when situations change. Both Merton (1940) and Blau (1960) have indicated how rules and procedures can become ends in themselves and thus prevent the organization from adjusting to new unexpected situations when they occur. Chandler's (1962) historical analysis of industrial organizations has also indicated the difficulties that large corporations had in responding to changes in their environments. Often, the necessary structural changes could not be implemented in the organization until there was a change in top management so that individuals, untied to past experiences, could institute changes.

Thus, these two requirements for stability and flexibility can be mutually exclusive. However, the system could solve this stability-flexibility dilemma by (1) alternating between flexibility and stability in its structuring of activities; (2) simultaneously expressing these two forms in different parts of the organization (Weick, 1969).

Organizational theorists such as Burns and Stalker (1961), Hall (1962), Lawrence and Lorsch (1967 a & b) and Pugh et al (1969) in their empirical work and Bennis (1960), Litwak (1961), and Argyris (1964) in their theoretical analysis have indicated that different configurations of organizational structure may be appropriate depending on the task the organization has to perform. For example, Burns and Stalker (1961) have identified two different organizational structures that are appropriate in different kinds of situations. In firms with a routine kind of task, a mechanistic type of organizational structure characterized by a rigid hierarchy of authority and centralized decision making, was most efficient.

These findings were a significant departure from the premise of one best organizational structure for all conditions that were postulated by the traditional bureaucratic theorists such as Weber (See Henderson and Parsons, 1947) and Gulick and Urwick (1937).

However, none of these theorists have considered that rather than implement one kind of organizational structure for decision making, there may be several kinds of decision making structures that may be implemented by the same decision unit in making different types of decisions to gather and process the necessary information to adapt effectively to the particular degrees of perceived uncertainty associated with the decision. It is predicted that decision units solve the stability-flexibility dilemma by alternating between flexibility and stability in their organizational structure. The same organizational decision unit may implement different organizational structures at different points in time.

Decision unit structure was conceptualized and measured in terms of five dimensions: I Hierarchy of Authority, II Degree of Impersonality in Decision Making, III Degree of Participation in Decision Making, IV Degree of Specific Rules and Procedures, V Degree of Division of Labor. These five dimensions of structure were derived from Weber's (See Henderson and Parsons, 1947: 330-332) theoretical discussion of bureaucracy. The rationale for taking this dimensional approach was that it could be determined if there were different configurations or profiles of these five structural dimensions that were effective for dealing with different levels of perceived environmental uncertainty experienced in

decision making.

It was predicted that the configurations or profiles of these five structural dimensions would vary for the different types of decisions that the decision unit had to make. For routine decisions for which definite procedures have been worked out and for which a relatively fixed response has been developed, a more structured profile across the five structural dimensions was predicted to be more effective in gathering and processing the information for decision making. When decisions were non-routine and there was no cut and dried method for handling them, the search and information processing needs were predicted to be greater for the decision unit. Here a different decision making structure profile less rigidly structured on the five structural dimensions was predicted to be more effective in gathering and processing the increased need for information in decision making.

When perceived uncertainty is high in a decision unit, it was predicted that there would be an even greater difference in the decision making structural profiles for the routine and non-routine decisions. In a unit experiencing high uncertainty, routine decisions will still have to be made. Here, the information gathering and processing needs are predicted to be low so that a more structured decision profile is predicted to be most effective. However, for the non-routine decision under this high level of perceived uncertainty, the information gathering and processing needs are predicted to be very high. In this case, the less structured decision making profile is predicted to be most effective for gathering and processing the increased information required for

decision making.

In decision units experiencing a low degree of perceived environmental uncertainty, the difference between the decision making structural profiles was predicted to be smaller. The profiles were predicted to be similar because the information needs between the routine and non-routine decisions are both expected to be relatively low. Here, the more structured profiles were predicted to be the most effective in gathering and processing the information that is required for decision making.

The major premise above then is that certain types of decision making structural profiles comprised of the five structural dimensions are more effective for adapting to the different degrees of perceived environmental uncertainty experienced by decision unit members in making routine and non-routine decisions.

Before developing specific hypotheses regarding the fit of the different decision making structural profiles to different organizational environments, it is important to identify the rationale for why decision making profiles toward the less structured end of the five structural dimensions are predicted to be more effective in dealing with perceived environmental uncertainty.

The dominant characteristic of the decision unit's structure seems to be its ability and potential to gather and process information. If a closer look is taken at the dimensions of structure specified above, each one ranging from a very low to a very high degree, they all seem to have important implications for the decision unit's ability to gather and process information. The degree of the decision unit's hierarchy of

authority, rules, procedures and division of labor has important implications for the decision unit's information processing regarding the state of its environment. When these dimensions are highly structured, the channels of communication are likely to be restricted and the amount of information available within the system restricted more than when the decision unit is toward the lower end of these dimensions. This is especially important when the environment is dynamic. In this case, a high level of perceived environmental uncertainty is predicted to be experienced in the unit with the resulting high need for obtaining and processing new information. With respect to dealing with this uncertainty, a very high degree of emphasis on the hierarchy of authority is likely to cause decision unit members to adhere to specified channels of communication and to selectively feed back only positive information regarding their job. They would, thus, be neglecting any negative feedback which might actually help the organizational unit better adapt (Read, 1962). Strict emphasis on rigid rules, procedures, and division of labor may prohibit the unit from seeking new sources of information when new information inputs are required to adapt to the uncertainty of the environment which may not have been foreseen when the rules and procedures were initially developed.

De-emphasizing impersonal behavior is also important for the information processing capabilities of the decision unit in an uncertain environment. When individuals are faced with uncertainty in their decision environment and strategies dealing with this uncertainty are not clearly covered by pre-established rules and procedures, greater reliance must

be made on the informal network of relationships. Conrath's (1967) research on budgeting behavior in NASA found that as uncertainty increased, there was greater reliance placed on informal kinds of decision making behavior which was to search out more information. Increased uncertainty may also create some anxiety and stress in decision unit members. Torrance's (1961) research on stress indicates that continued stress within the group destroys communication linkages and reduces the group's level of performance. Schroder, Driver, and Streufert's (1967) research on human information processing indicates that the effectiveness of group information processing decreases under stress. Being able to call on colleagues in whom they can trust might reduce this stress. Blau (1960) has indicated that informal relations is one process along with competence that can integrate the individual into the group. By integrating individuals fully into the group, the group's information processing abilities are potentially increased by the individual's commitment to working toward achieving group goals. Lanzetta (1955) has also indicated that in ambiguous situations primary group relations may help reduce the threat and stress of uncertainty. This, in turn, may facilitate the group's information processing potential.

Dealing openly with interpersonal behavior and feelings is important in the information processing potential of the decision unit because of the potential conflict that might arise among decision unit members as they try to reach decisions in adapting to the uncertainty in their environment. This is consistent with Argyris' (1962) research that indicates that if a social system develops a set of values and norms

supporting openness in interpersonal relations, this can lead to increased effectiveness in decision making. It may also be necessary, as Blake, Shepard, and Houton's (1964) research indicates, to build in specific problem solving and conflict reducing structures within the organization.

Finally, greater participation in decision making may increase the information processing potential of the decision unit when faced with perceived uncertainty in their environment by bringing new insights and sources of information into the unit as well as providing more sources of feedback and resulting checks on the unit's behavior (see Collins and Guetzkow, 1964; Maier, 1970). Greater participation in decision making also has the potential of integrating Hall's (1971) "new breed of employees" with their increased emphasis on participation and having some control over their work environment.

If the decision unit's environment is more certain, it is predicted that the decision unit's information processing capabilities may be more effective when the decision making structural profiles approach the more structured ends of the continuum of the five dimensions of structure. Here, the information demands on the decision unit are minimal, and it can respond more quickly to its environment by relying on pre-established rules and procedures, a well-specified division of labor, etc. Argiris (1964), Thompson and Tuden (1958) and Katz and Kahn (1966) have all indicated that the more rigidly structured pyramidal decision making structure should be used when: 1) time is of the essence; 2) in routine decision making instances; 3) when environmental demands are clear and

their implications are obvious; 4) organizational circumstances approximate those of closed systems with minimal change requirements from the environment.

The major premise of the model under discussion then, is that organizational decision units have to be structurally flexible enough to relate themselves to the uncertainty of their environment. An essential characteristic of the concept of organizational structure is the intercommunication of information. In order for an organizational decision unit to make decisions and react to its environment, it must be able to gather and process the relevant information concerning its internal and external environment such that: 1) it can become aware of the state of its internal and external environment; 2) it can assess what alternative courses of action are available to it in responding to the decision making situation. By generating and processing information in an effective manner, the decision unit can more effectively interact with its environment and obtain the necessary feedback on the effectiveness or ineffectiveness of its adaptation.

Perceived Influence over the Environment and Decision Making Structural Profiles Implemented

The extent and degree to which the decision making structural profiles for routine and non-routine decision differ, it is predicted, depends on the decision unit's perception as to whether it can influence the factors in its environment which are contributing to the perceived uncertainty. Perceived influence over the environment is defined in terms of the decision unit's ability to: 1) affect the demands made on

it; 2) affect the expectations of performance made on it; 3) deal with alternatives to, and 4) have some control over the factors and components taken into consideration by the decision unit in the decision making process. It is predicted that the more the decision unit is able to affect the demands and expectations of environmental factors, as well as deal with alternatives to a specific factor or have some control over a given environmental factor, the more influence the decision unit is going to perceive itself to have over the environment.

For example, a supplier which is an external environment factor, may not be providing the necessary information regarding parts delivery dates to a production decision unit. The result may be that the given decision unit may experience some degree of perceived uncertainty in the decision making process regarding the implementation of new products into line production.

If the production decision unit in this example perceives that it can influence this uncertainty producing factor, it may in its decision making procedures if the resulting uncertainty is high, try to develop ways to reduce this uncertainty. The decision unit might perceive itself to have some influence over this factor if it was a large scale customer of the supplier, and the supplier was somewhat dependent on the decision unit for buying its parts. In this case, the decision unit could exert its influence by looking for new suppliers or by considering manufacturing the part itself, i.e., there are alternatives to dealing with the given factor. In this case, it is predicted that a more flexible decision making structural profile would be more effective for exploring these alternatives. On the other hand, if the supplier was

the only source for the part with many buyers, i.e., there are no alternatives open to the unit in dealing with the given factor, the decision unit would have little influence with the supplier, and the increased time spent in implementing the different decision making structures in exploring alternatives would have little payoff to the decision unit. It is predicted then, that the decision unit would perceive no benefit in incurring the costs of implementing the different decision making structures for routine and non-routine decisions. The result, then, would be that the decision making structural profiles would be similar.

The point being emphasized is that the extent to which decision unit members implement different decision making structures in attempting to adapt to environment uncertainty, depends on whether or not decision unit members perceive that they have some influence over the uncertainty producing factors in the environment.

By combining the perceived environmental uncertainty and influence over the environment dimensions, four different states of uncertainty and influence over the environment were identified for organizational decision units. The predicted most effective combinations of decision making profiles for routine and non-routine decisions for dealing with these different environmental states were then identified. (See Table 1)

Insert Table 1 Here

The rank order from high to low of predicted differences between the

routine and non-routine profiles is as follows: (1) Cell IV; (2) Cells I, II, III were predicted to have relatively little difference between the two profiles. The rationale for these predictions was that it was only when uncertainty is high that the information demands are going to be great for the decision unit. This is particularly the case in dealing with non-routine decisions where the impact of high uncertainty is expected to be great. A more flexible decision making structure (Cell IV) across the five structural dimensions for non-routine decisions was predicted to exist and be most effective when the decision unit perceived that it had some influence over environmental factors, and was aware of the utility in investing the time and increased system resources required in implementing the more flexible decision structure. For routine decisions, a more rigid decision making structure was still predicted to exist and be effective for gathering and processing the smaller amount of the information required for this type of decision. Thus, under conditions of high uncertainty and high influence (Cell IV), the decision making profiles for routine and non-routine decisions were expected to differ the most.

When perceived uncertainty is high, but decision unit members perceive that they have low influence over their environment (Cell III), it was predicted that the unit was less likely to perceive the utility in investing the increased time and other system resources in implementing a different, more flexible decision making profile for non-routine decisions. Little difference was then predicted to exist between the two profiles. The decision unit will respond in both routine and non-routine

decisions by rigidly structuring its hierarchy of authority to coordinate its decision making to find a quick means of trying to influence environmental factors contributing to the high uncertainty. The decision unit, in a very real sense, is responding to an 'emergency' situation and to the severe time constraints that accompany it. The less structured decision profile with its increased time demands were not expected to be appropriate under these conditions. This prediction is consistent with the work of Thompson and Tuden (1959) and Argyris' (1964) in emphasizing that in emergency situations and when time is of the essence, the pyramidal type of decision structure is most effective for decision making.

RESULTS

Differences in Routine and Non-Routine Decision Making Profiles

Profile analysis was then performed on the routine and non-routine decision structures across the five structural dimensions for the 22 decision units in the sample. Two profile difference measures were implemented to identify the degree to which the profiles differed.

Level Dissimilarity (Lev. Diss.) measured the extent to which the average level of the profiles differed -- were the routine profiles more structured than the non-routine profiles? The higher this index the greater the difference in the profiles. Shape Correlation measures the correlation of the two profile shapes irrespective of their levels. The lower this correlation, the greater the difference in the profiles (Cohen 1969). The profiles and the results of the profile analysis are presented in Table 2. ⁵

Insert Table 2 Here

A 2 x 2 analysis of variance was performed to determine what effect the two levels of perceived environmental uncertainty and perceived influence over the environment had on the two profile difference measures. Table 3 summarizes the F-ratios for the two profile difference measures. Table 4 summarizes the multiple comparisons of the a priori predicted differences for the cell means in Table 1 for each of the two profile difference measures.

Insert Table 3 Here

Insert Table 4 Here

It was indicated in Table 1 that under the following conditions of perceived environmental uncertainty and perceived influence over the environment, decision units would exhibit little difference in their routine and non-routine profiles:

Low Perceived Uncertainty + Low Perceived Influence
over the Environment (Cell I)

Low Perceived Uncertainty + High Perceived Influence over
the Environment (Cell II)

High Perceived Uncertainty + Low Perceived Influence over
the Environment (Cell III)

Inspection of the summary of the multiple comparisons in Table 4 indicates there are no significant differences between Cells I, II, III, across the two profile difference measures, and this supports the predictions. Thus, when decision units experience low uncertainty, it apparently

matters little whether the decision unit perceives that it has high or low influence over its environment in decision making. Under low uncertainty, the information gathering and processing needs for both routine and non-routine decisions are low. Thus, the information needs for the unit can be handled for both routine and non-routine decisions by very structured decision making procedures, i.e., the profiles are essentially the same.

Inspection of the multiple comparisons in Table 4 also indicates that decision units that experience high uncertainty and high perceived influence over their environment (Cell IV) exhibited the greatest differences in their routine and non-routine decision making profiles. Decision units under these levels of uncertainty and influence exhibited significantly different scores on the profile difference measures than did the decision unit under low uncertainty-low perceived influence (Cell I), low uncertainty-high perceived influence (Cell II), and high uncertainty-low perceived influence (Cell III). Thus, when uncertainty is high and the unit perceives it has some influence over its environment, it differentiates its decision making procedures to deal with the information gathering and processing requirements that accompany high uncertainty. ⁶

Differences in Routine and Non-routine Decision Making Profiles and Decision Unit Effectiveness

Above, it was indicated that the predicted differences in the decision making profiles under different conditions of perceived uncertainty and perceived influence over the environment would be associated with decision unit effectiveness. Decision unit effectiveness as used in

this analysis, is comprised of three interrelated components. First, the effective decision unit must be moving toward attaining its formally defined goals and objectives. Second, to be effective the decision unit must integrate the individual into a social system through clearly defined organizational roles with clearly defined role expectations such that role conflict and role ambiguity will be low for the individual. Thrid, a decision unit to remain viable, must adapt to its environment. A decision unit can achieve this adaptability by structuring itself so that individual decision unit members can adapt to changes in the decision unit's environment when they occur.

The standard procedure by which to perform this analysis would have been to divide each of the four cells in Table 1 (see diagrams in Table 2) in two into high effectiveness and low effectiveness groups, thus yielding an eight cell table. Decision units would then be rank ordered by their scores on the effectiveness scale and assigned to the proper cells. Then, for example, decision units under low uncertainty and low perceived influence over the environment that were effectively adapting to their environment could be compared to units under low uncertainty-low perceived influence that were not effectively adapting to their environment to determine if there are any differences in their profiles for routine and non-routine decisions. Howerer, this type of analysis was infeasible in this study because of the small sample size, N=22 and the skewed nature of the effectiveness dimension. Given these limitations, a more global analysis was performed to determine if the differences in the routine and non-routine decision making profiles, as measured in the two profile difference measures, were associated

with different levels of decision unit effectiveness. Inspection of the hypotheses presented in Table I indicate that under conditions of high perceived environmental uncertainty, there are to be greater differences in the decision profiles. Therefore, under conditions of high perceived uncertainty, there should be a higher correlation between the two structural difference measures and the dimensions of decision unit effectiveness, as the differences in structure are predicted to be more effective here than under low uncertainty. This same explanation holds true for perceived influence over the environment. Under conditions of high perceived influence, there should also be a higher correlation between the two structural difference measures and the dimensions of decision unit effectiveness, than under conditions of low perceived influence over the environment. To perform this analysis, the 22 decision units were first split into high and low uncertainty groups, and correlations were performed within these two groups between the dimensions of effectiveness and the profile difference measures (Table 5). The groups were then split into high and low influence groups, and correlations between the effectiveness and the two profile difference measures were computed (Table 6).

Insert Table 5 Here

Insert Table 6 Here

Inspection of Table 5 indicates that, as predicted, under conditions of high uncertainty the profile difference measures are highly correlated with the four dimensions of effectiveness, as well as the over-all total effectiveness score. Under conditions of low perceived uncertainty, these correlations are greatly reduced. Therefore, it appears that as uncertainty increases there is a high correlation between the differences in the decision making structural profiles and decision unit effectiveness. Thus, under conditions of high uncertainty, decision units that were effectively adapting to their environment implemented different decision making structural profiles for routine and non-routine decisions.

Inspection of Table 6 indicates, in general, higher correlations for the two profile difference measures and decision unit effectiveness under conditions of low perceived influence over the environment which is contrary to the above prediction. It may be that under conditions of low perceived influence over the environment, decision units that are more effective implement different decision making profiles in attempting to gain some influence over the environment. Thompson (1967: 32-38) had indicated that organizations seek to minimize the power of environmental elements over them by maintaining alternatives and attempting to gain some control over their environments. Thus, contrary to the prediction above, it may be that it is under conditions of low perceived influence over the environment, that it is important to implement different kinds of decision making procedures for dealing with non-routine decisions, as the information needs are high in attempting to develop ways of gaining some control over the environment.

Conclusions

This paper has presented a model of how organizations adapt to the uncertainty in their environment by making changes in the way they structure themselves for decision making. The research reported here has indicated that it is not just a single change in organization structure, but rather a shifting between more rigid and more flexible decision structure that facilitates effective adaptation to an uncertain organizational environment.

REFERENCES

Argyris, C.

- 1962 Interpersonal Competence and Organizational Effectiveness. Homewood: Irwin.
- 1964 Integrating the Individual and the Organization. New York: Wiley.

Ashby, W. R.

- 1956 An Introduction to Cybernetics. London: Chapman and Hall.

Bennis, W. G.

- 1960 "Organizational developments and the fate of bureaucracy." Industrial Management Review, 7:41-57.

Blake, R., Shepard, H., and Mouton, J.

- 1964 Managing Intergroup Conflict in Industry. Houston: Gulf Publishing Co.

Blau, P.

- 1960 "Orientation toward clients in a public welfare agency." Administrative Science Quarterly, 5:341-361

Brown, L.D.

- 1971 "Leading parts and organizational change." Paper delivered at 79th Annual convention of the American Psychological Association, Washington, D.C.

Burns, T., and Stalker, G.

- 1961 The Management of Innovation. London: Tavistock Publications

Cadwalller, M. D.

- 1959 "The cybernetic analysis of change in complex organizations."
American Journal of Sociology. 65:154-157

Chandler, M. D.

- 1962 Strategy and Structure. Cambridge: M.I.T. Press.

Cohen, J.

- 1969 "Rc: a profile similarity co-efficient invariant over
variable reflection." Psychological Bulletin, 4:281-284

Collins, B., and H. Guetzkow

- 1964 A Social Psychology of Group Problem Solving. New York:
John Wiley.

Conrath, D.W.

- 1967 "Organizational decision making behavior under varying
conditions of uncertainty." Management Science, 13:487-500

Crozier, M.

- 1964 The Bureaucratic Phenomenon. Chicago: University of Chicago
Press

Cyert, R., and J. G. March

- 1963 A Behavioral Theory of the Firm. Englewood Cliffs: Prentice
Hall

Deutsch, K. W.

- 1963 The Nerves of Government. Glencoe: Free Press.

Duncan, R.

- 1971a The Effects of Perceived Environmental Uncertainty on
Organizational Decision Unit Structure. Unpublished Ph.D.
dissertation. Yale University, New Haven, Connecticut.

- 1971b Multiple Decision Making Structures In Adapting to Environmental Uncertainty: The Impact on Organizational Effectiveness. Working Paper #54-71 Graduate School of Management Northwestern University.
- 1971c Characteristics of Organizational Environments and Perceived Environmental Uncertainty. Working Paper #62-71 Graduate School of Management Northwestern University.

Guilick, C.F. and L. Gulick

- 1937 Papers in the Science of Administration. New York: Columbia University Press.

Hall, D. T.

- 1971 "Organization change through new breeds of employees." Paper delivered at 77th Annual Convention of the American Psychological Convention, Washington, D.D.

Hall, R. H.

- 1961 An Empirical Study of Bureaucratic Dimensions and Their Relation to Other Organizational Characteristics. Unpublished Ph.D. dissertation, Ohio State University, Columbus, Ohio.
- 1962 "The concept of bureaucracy: an empirical assessment." American Journal of Sociology, 69:32-40.

Henderson, A. H. and T. Parsons

- 1947 Max Weber: The Theory of Social and Economic Organization. New York: Oxford University Press.

Katz, D., and R. Kahn

1966 The Social Psychology of Organizations. New York: Wiley.

Lanzetta, J.

1955 "Group behavior under stress." Human Relations, 8:552-558

Lawrence, P. and J. Lorsch

1967a "Differentiation and integration in complex organizations."
Administrative Science Quarterly, 12:1-47

1967b Organization and Environment: Managing Differentiation
and Integration. Boston: Division of Research, Graduate
School of Business Administration, Harvard University.

Litwak, E.

1961 "Models of bureaucracy which permit conflict." American
Journal of Sociology, 67:177-184.

McNulty, J. E.

1962 "Organizational change in growing enterprises." Administrative
Science Quarterly, 7:1-21.

Maier, N. R. F.

1970 Problem Solving and Creativity: In Individuals and Groups.
Belmont, California : Brooks-Cole Publishing Company.

Merton, R. K.

1940 "Bureaucratic structure and personality." Social Forces, 23:
560-568.

Parsons, T.

1956 "Suggestions for a sociological approach to the theory of
organizations -1." Administrative Science Quarterly, 1.

Pugh, D. S., J. D. Hickson, C. R. Hinings, and C. Turner

- 1969 "The context of organization structures." *Administrative Science Quarterly*, 14:91-114.

Read, W. H.

- 1962 "Upward communication in industrial hierarchies." *Human Relations*, 15:3-15.

Schroder, H. N., M. J. Driver and S. Streufert

- 1967 *Human Information Processing: Individuals and Groups Functioning in Complex Social Situations*. New York: Holt, Rinehart and Winston.

Terreberry, S.

- 1968 "The evolution of organizational environments." *Administrative Science Quarterly*, 12:590-614.

Thompson, J. D. and A. Tuden

- 1959 "Strategies, structures, and processes of organizational decision." In J. Thompson, P. Hammond, R. Hawkes, B. Junker, and A. Tuden (eds.), *Comparative Studies in Administration*: 195-217. Pittsburgh: University of Pittsburgh Press.

Thompson, J. D.

- 1967 *Organizations in Action*. New York: McGraw-Hill.

Torrence, E. P.

- 1961 "A theory of leadership and interpersonal behavior under stress." In C. Petrullo and B. Bass (eds.), *Leadership and Interpersonal Behavior*. New York: Holt, Rinehart and Winston: 82-100.

Weick, K. E.

1969 The Social Psychology of Organizing. Reading, Massachusetts:
Addison-Wesley.

Wiener, N.

1948 Cybernetics. Cambridge: M.I. T. Press.

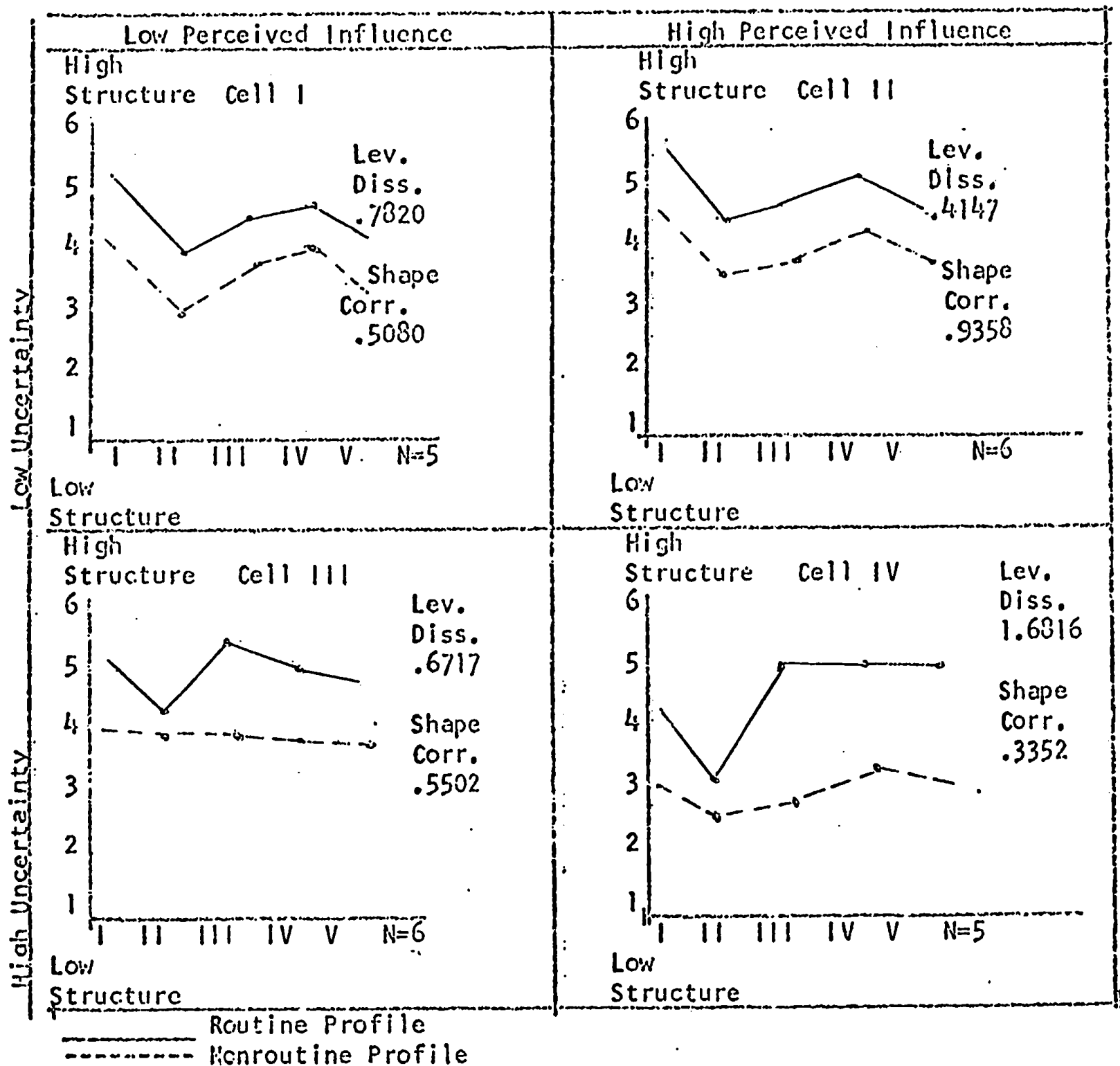
Table 1

Perceived Uncertainty and Influence over the Environment in
Decision Making, and Effective Decision Making Profiles

	Low Influence	High Influence
Low Uncertainty	<p><u>CELL I</u></p> <p>Decision Making Structural Profiles for routine and non-routine decisions expected to <u>both</u> be highly structured across the 5 structural dimensions</p>	<p><u>CELL II</u></p> <p>Decision Making Structural Profiles for routine and nonroutine decisions are expected to <u>both</u> be highly structured across the 5 structural dimensions</p>
High Uncertainty	<p><u>CELL III</u></p> <p>Decision Making Structural Profiles for routine and nonroutine decisions expected to <u>both</u> be highly structured across the 5 structural dimensions</p>	<p><u>CELL IV</u></p> <p>Decision Making Structural Profiles for routine and nonroutine decisions are expected to <u>differ</u> with the routine decision profile being more highly structured across the 5 structural dimensions</p>

Table 2

Profile Analysis for Routine and Nonroutine Decisions



Structural Dimensions

- I. Hierarchy of Authority
- II. Impersonality in Decision Making
- III. Participation in Decision Making
- IV. Rules and Procedures
- V. Division of Labor

Table 3

Summary of F-Ratios, Analysis of Variance, Perceived
Uncertainty* Perceived Influence over the Environment
for Profile Difference Measures

	Uncertainty	Influence	Uncertainty· Influence
Level Dissimilarity	7.115**	2.196	10.088**
Shape Correlation	8.977**	1.244	10.251**

* $p < .05$
** $p < .01$

Table 4

Summary of Multiple Comparisons, Cell Means, Perceived
Uncertainty* Perceived Influence Anova's for Profile
Difference Measures

Cells Compared (Table 1)	Critical Differences 18 d.f.	
	Level Dissimilarity	Shape Correlation
I & IV	$p < .01$	$p < .01$
I & III	NS	NS
I & II	NS	NS
II & IV	$p < .01$	$p < .01$
II & III	NS	NS
III & IV	$p < .01$	$p < .01$

Table 6

Correlations of Profile Difference Measures and Decision Unit Effectiveness Dimensions and Total Score under High and Low Perceived Influence over the Environment for Decision Units

	High Perceived Influence N=11			Low Perceived Influence N=11		
	Role Conflict	Role Amb.	Adapt-abil.	Goal Att.	Total Effect.	Total Effect.
Level Dis.	.450	.038	-.108	.116	.441	.638
Shape Cor.	-.623*	-.347	-.197	.058	-.689*	-.517

* p < .05 *** p < .01

Table 5

Correlations of Profile Difference Measures and Decision Unit Effectiveness Dimensions and Total Score under High and Low Perceived Environmental Uncertainty for Decision Units

	High Uncertainty N=11			Low Uncertainty N=11		
	Role Conflict	Role Amb.	Adapt-abil.	Goal Att.	Total Effect.	Total Effect.
Level Dis.	.942***	.958***	.959***	.955***	.976***	.976***
Shape Cor.	-.959***	-.951***	-.951***	-.921***	-.969***	-.969***

* p < .05

*** p < .01